

What Is Claimed Is:

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1. A removal device for an occlusion, comprising:  
 a catheter for insertion into a body passageway, said catheter having a distal end,  
 a support wire insertable through said catheter, said wire having a distal end,  
 a blocking mechanism on the distal end of said catheter, said blocking mechanism  
 having a radially compressed state for insertion into the body passageway and a radially  
 expanded state extending near to the wall of said passageway to block passage of material  
 around the outside of the distal end of said catheter,  
 an occlusion engaging element supported on said distal end of said wire, said  
 10 engaging element having a radially compressed state for insertion of said wire through said  
 catheter and through or around whatever occlusion is to be engaged and a radially expanded  
 state to engage the occlusion,  
 expansion of said engaging element when positioned distally of an occlusion and  
 subsequent proximal movement of said engaging element forcing the occlusion into said  
 15 catheter.
2. The removal device of claim 1, wherein:  
 said blocking mechanism is a multi-wing malecot style mechanism, and  
 said engaging element is an annular braided segment.
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3. The removal device of claim 1, wherein:  
 said blocking mechanism and said engaging element are both annular braided  
 segments, and  
 said engaging element is one of the group of annular braided segment, malecot  
 and inflatable annular balloon.
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4. The removal device of claim 1, wherein said engaging element in said  
 expanded state contacts the wall of the passageway in which it is inserted.
5. The removal device of claim 2, wherein said engaging element in said  
 expanded state contacts the wall of the passageway in which it is inserted.
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6. The removal device of claim 1, wherein said occlusion engaging element is a braided element having individual yarns sufficiently flexible to be moved between said states and sufficiently stiff to substantially hold said expanded state when removing the targeted occlusion.

5 7. The removal device of claim 6, wherein said blocking mechanism is a multi-wing malecot having an annular elastomeric film around said wings.

8. The removal device of claim 1, wherein said blocking mechanism is a multi-wing malecot having an annular elastomeric film around said wings.

10 9. The removal device of claim 1, wherein said blocking mechanism is a multi-wing malecot adapted to have a funnel shape.

10 10. A removal device for an occlusion, comprising  
a support wire having a distal end,  
an engaging element having a retracted insertion state and an expanded occlusion  
15 removal state, said support wire including user operable means for moving said removal element  
from said retracted state to said expanded state,  
expansion of said engaging element when positioned distally of an occlusion.

20 11. The removal device of claim 10, wherein said engaging element is a braided engaging element having individual yarns sufficiently flexible to be moved between said states and sufficiently stiff to substantially hold said expanded state when removing the targeted occlusion.

12. The removal device of claim 10, wherein said engaging element is a multi-wing malecot style engaging element.

25 13. The removal device of claim 10, wherein said engaging element, after expansion, is adapted to force the occlusion to move in a proximal direction when said engaging element is proximally moved.

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14. A catheter for use in receiving an occlusion from a body passageway into which the catheter is placed, the improvement comprising:

a blocking mechanism on the distal end of said catheter,

said blocking mechanism having a radially retracted insertion state and a radially  
5 expanded blocking state,

an actuator associated with said catheter to move said blocking mechanism from said retracted state to said expanded blocking state,

expansion of said blocking mechanism when said catheter is inserted into a body passageway assuring that material being removed in a proximal direction from a position in said  
10 passageway that is distal of said catheter will enter the lumen of said catheter and will be blocked from the body passageway external of said catheter or to act as a seal for aspiration.

15. The catheter of claim 14, wherein said blocking mechanism is a multi-wing malecot style blocking mechanism including an annular elastomeric film around said wings.

16. The catheter of claim 14, wherein said blocking mechanism has a braided  
15 configuration.

17 A method of removing an occlusion, comprising the steps of:  
inserting a catheter into a body passageway,  
inserting a support wire through said catheter, said wire having a distal end and  
20 having an occlusion engaging element supported on said distal end of said wire, said engaging element having a radially compressed state for insertion of said wire through said catheter,  
inserting said engaging element in the radially compressed state through or around whatever occlusion is to be engaged, and  
radially expanding said engaging elements to a radially expanded state when said  
25 engaging element is positioned distally of said occlusion.

18. The method of claim 17, further comprising the step of proximally moving said engaging element to force the occlusion into said catheter.

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19. The method of claim 17, wherein said engaging element is a braided element having individual yarns sufficiently flexible to be moved between said states and sufficiently stiff to substantially hold said expanded state when removing the targeted occlusion.

20. The method of claim 17, wherein said engaging element is a multi-wing malecot style mechanism.

21. The method of claim 17, wherein a blocking mechanism is coupled to a distal end of said catheter, said method further comprising the steps of providing said blocking mechanism in a radially compressed state during insertion of said catheter into the passageway, and providing said blocking mechanism in a radially expanded state extending near to the wall of said passageway after insertion of said catheter into the passageway to block passage of material around the outside of the distal end of said catheter.

22. A method of removing an occlusion, comprising the steps of:  
inserting a catheter into a body passageway, said catheter having at a distal end a blocking mechanism,  
providing said blocking mechanism in a radially compressed state during insertion of said catheter into the passageway, and  
radially expanding said blocking mechanism to a radially expanded state extending near to the wall of said passageway after insertion of said catheter into the passageway to block passage of material around the outside of the distal end of said catheter.

23. The method of claim 22, wherein said blocking mechanism is a multi-wing malecot style mechanism.

24. The method of claim 22, wherein the step of radially expanding said blocking mechanism is carried out by expanding said blocking mechanism into a funnel shaped mechanism.

25. A method of removing an occlusion, comprising the steps of:

inserting a support wire into a body passageway, said wire having at a distal end a blocking mechanism,

providing said blocking mechanism in a radially compressed state during insertion of said wire into the passageway, and

5 radially expanding said blocking mechanism to a radially expanded state extending near to the wall of said passageway after insertion of said catheter into the passageway to block passage of material around the outside of the distal end of said wire.

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